ODESSA BRIDGE
(State Bridge No. 393)
Spanning the Appoquinimink River
at Main Street (State Road 299)
Odessa
New Castle County
Delaware

HAER No. DE-28

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
Northeast Region
U.S. Custom House
200 Chestnut Street
Philadelphia, PA 19106

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HISTORIC AMERICAN ENGINEERING RECORD
ODESSA BRIDGE
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LOCATION: Main Street (State Road 299), spanning the Appoquinimink River, Odessa, New Castle County, Delaware

USGA *Middletown, DE* Quadrangle
UTM Coordinates: 18.443627.4366982

DATE OF CONSTRUCTION: Engineering Design/Detail Plans Dated 1927 - Actual Construction 1928

BUILDER/DESIGNER: New Castle County Engineer Charles E. Grubb under guidance of Harrington Howard and Ash – Consulting Engineers, Kansas & New York

PRESENT OWNER: Delaware Department of Transportation (DelDOT), Dover, DE

PRESENT USE: Transportation Use - Vehicular

SIGNIFICANCE: The Odessa Bridge is a steel plate girder, bobtail swing bridge that rotates on a center bearing, appropriate to a relatively short light span. The bobtailed swing form is relatively unusual, and the Odessa Bridge is one of two remaining historic bobtail bridges in the state. The Odessa Bridge replaced an earlier, cable-stayed metal truss swing bridge. The Odessa Bridge exemplifies the continuing expansion and improvement of the road network under the auspices of the New Castle County Engineer's Office prior to the Delaware Department of Transportation assumption of responsibility for construction and maintenance of all local and state roads in 1935.

PROJECT INFORMATION: In mid-March 1990, excessive deterioration of the deck and structural components caused the structure to be unsafe. The bridge was immediately closed. Emergency repair accelerated the bridge schedule for repair. The repair work involved replacement of the entire deck abutment walls. As part of the emergency schedule mitigation, this recordation was undertaken pursuant to an agreement between the Delaware Department of Transportation, US Army Corps of Engineers, and the Delaware State Historic Preservation Office. The Odessa Bridge was photo recorded and in spring 1990 with written documentation undertaken in March 1997 by the Delaware Department of Transportation, Dover, DE. Photography was performed by James T. O'Brian, External Affairs. Research was conducted by Mary I. Raley, AICP and Michael C. Hahn, AICP, both DelDOT Senior Transportation Planners.

DESCRIPTION

The Odessa Bridge (State Bridge NO. 393) is a 98'-6" steel plate girder wing span. The center-bearing wing span rotates. The bridge also has a bobtail configuration (i.e.- the pier is located off-center, with a 39'-4" span on the shorter, east end and a 57'-9" span on the longer, west end. Despite these two span differences, the bridge does not require a counterweight to balance it. The steel plate girders are 6'-6" deep, with 5" x 3" angles acting as stiffeners. The concrete deck is supported on floor beams and measures 22'-6" wide and carries two lanes of transportation traffic. When closed, the structure rests on concrete abutments with U-shaped wing walls. The cylindrical center pier is concrete and is supported on timber piles. Concrete parapets surmount the wing walls with solid end blocks spanned by a lower wall which is incised with rectangular (Luten type) panels.

HISTORY OF THE ODESSA BRIDGE

The Odessa Bridge is one of two remaining historic bobtail swing bridges on Delaware State inventoried transportation systems. The Lewes Swing Bridge, State Bridge No. 929R, is the only other bobtail bridge that exemplifies this design within the State Department of Transportation's ownership or responsibility. While the Odessa Bridge was replaced in 1990/91 with different deck, the Lewes Swing Bridge was fully rehabilitated in-kind back in 1997.

Delaware Department of Transportation records indicate that the Odessa Bridge was built in 1928. A plaque reveals the 1928 construction date, and credits Charles E. Grubb, County Engineer; the Selbyville Manufacturing Contracting Company; and consulting engineers of Harrington, Howard, and Ash. The members of the New Castle County Levy Court are also named. Before the bridge's replacement in 1990/91, the swing mechanism had been inoperable for over forty years. Photo and record archives at the Delaware Department of Transportation indicate that the Odessa Bridge replaced an earlier, cable-stayed metal truss swing bridge. Original 1928 contract plans included in this document illustrate and detail the previous bridge as well as the current bobtail swing bridge. According to these drawings, the bridge was designed to carry two fifteen-ton trucks with 30% impact. The swing mechanism was also incorporated to the bridge to provide local navigational commerce and up-river shipbuilding needs.

The New Castle County Engineer's Reports detail rural bridge bond funding for the construction of the Odessa Bridge amounting to $43,236.67. This included the cost of advertising, blueprints, engineering, and construction. The Odessa Bridge was designed by the firm of Harrington, Howard, and Ash of Kansas City – Missouri. This firm was known to specialize in movable bridges. Several other movable bridge in Delaware were designed by principals of this firm or its successors.

John Lyle Harrington and Ernest E. Howard both began their bridge building/engineering careers in association with J.A.L. Waddell, whose 1892 design for a vertical lift bridge at South Halstead Street in Chicago had established his entrance as a pioneer of the type. Harrington went to work in Waddell's office in Kansas City, Missouri, after graduating from the University of Kansas in 1895; he left to pursue further education and worked for a succession of bridge companies until 1907, when he returned to Kansas City to enter a consulting practice in partnership with Waddell. It was there that he met Howard, who had been working with the firm or Waddell and Hendrick

since 1901 as draftsman, designer, and resident engineer. Upon the 1907 reorganization of the firm, as Waddell and Harrington, Howard assumed the position of associate engineer.

In 1914, Harrington, Howard, and Louis R. Ash formed Harrington, Howard and Ash which designed and constructed bridges until 1928. In addition to the Odessa Bridge, their work in Delaware includes State Bridge No. 688, a bascule span built in 1927 to carry South Market Street over the Christina River in Wilmington. They also were consulting engineers for the 1928 Rising Sun Bridge over the Brandywine Creek near Wilmington (State Bridge No. 1), the only through steel truss bridge identified within the state. Howard and Ash became associated with the firm of Ash, Howard, Needlles and Tammcn. They designed the bascule bridge carrying North Church Street over the Brandywine in Wilmington (State Bridge No. 577 built in 1932). Both Harrington and Howard patented numerous improvements to movable bridges. Within their careers, they both also held offices in national professional organizations. Howard specifically, contributed articles to several professional journals on their work.

According to maintenance files, the Odessa Bridge has not been opcned since 1950, when the swing machinery became inoperable. In 1977, the United States Coast Guard declared the bridge officially closed to navigation and approved the placement of a 12" sewer force main.

Due to severe weathering and deterioration, the structure in 1990 was scheduled for maintenance and rehabilitation work, including replacing the superstructure and a new pier cap. In mid-March 1990, recent inspection during preconstruction design found the bridge deck in worse shape than anticipated. Holes were evident in the deck, causing reinforcement to be exposed. Deterioration of concrete abutments were evident throughout. The bridge was immediately closed to the public due to safety and structural concerns. Repair schedules were immediately increased due to the emergency closure declaration. In the winter of 1990, repair construction began. The only remaining portions salvaged from the bridge were the center pier pivot and the navigational fender system that was essentially abandoned and/or left in-place.

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LOCATION MAP

SKETCH DESIGN